FIG. 1

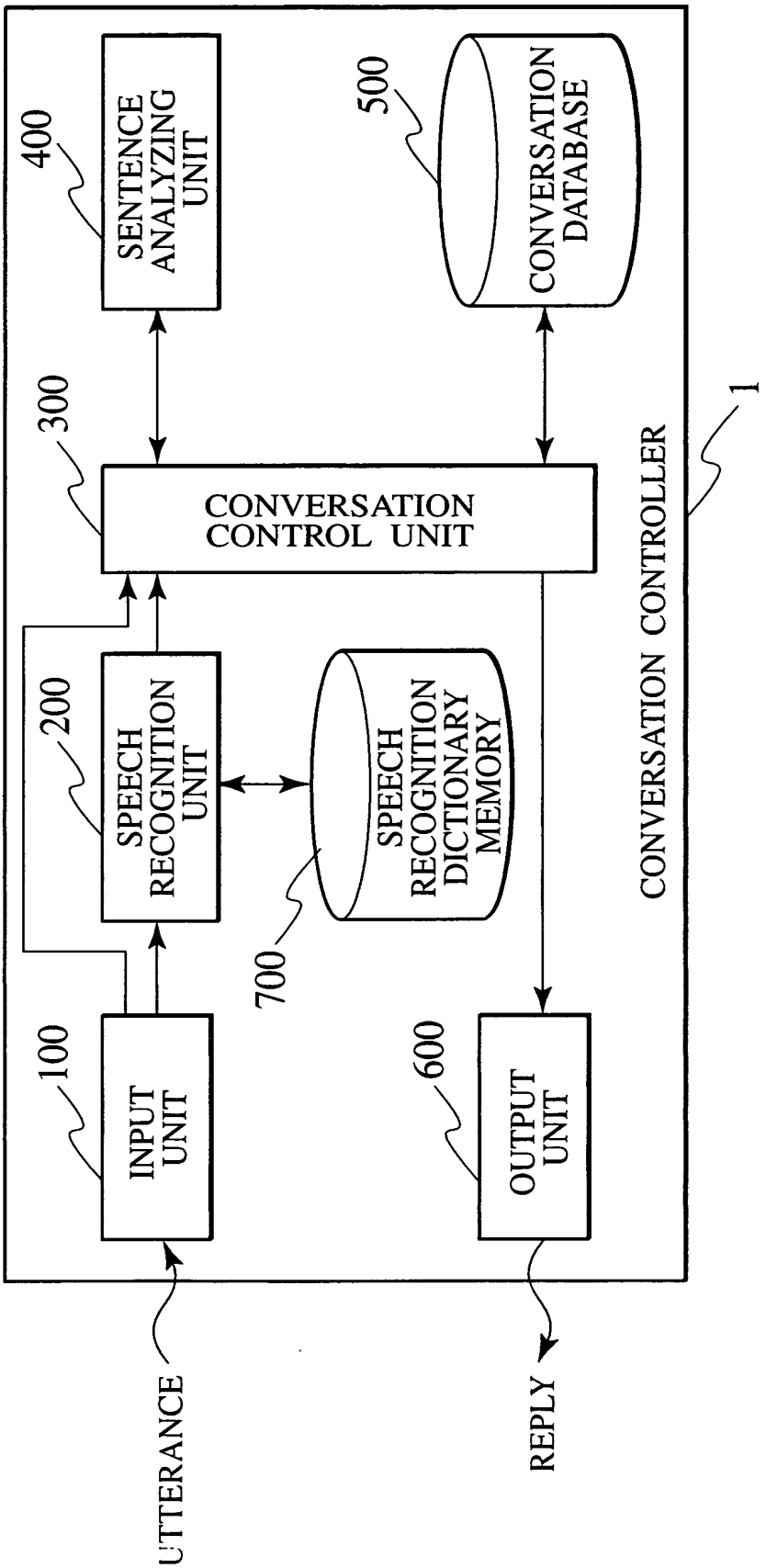
CONVERSATION CONTROLLER
1
SENTENCE ANALYZING UNIT
400
CONVERSATION DATABASE
500
CONVERSATION CONTROL UNIT
300
SPEECH RECOGNITION UNIT
200
SPEECH RECOGNITION DICTIONARY MEMORY
700
INPUT UNIT
100
OUTPUT UNIT
600
UTTERANCE
REPLY

FIG. 2

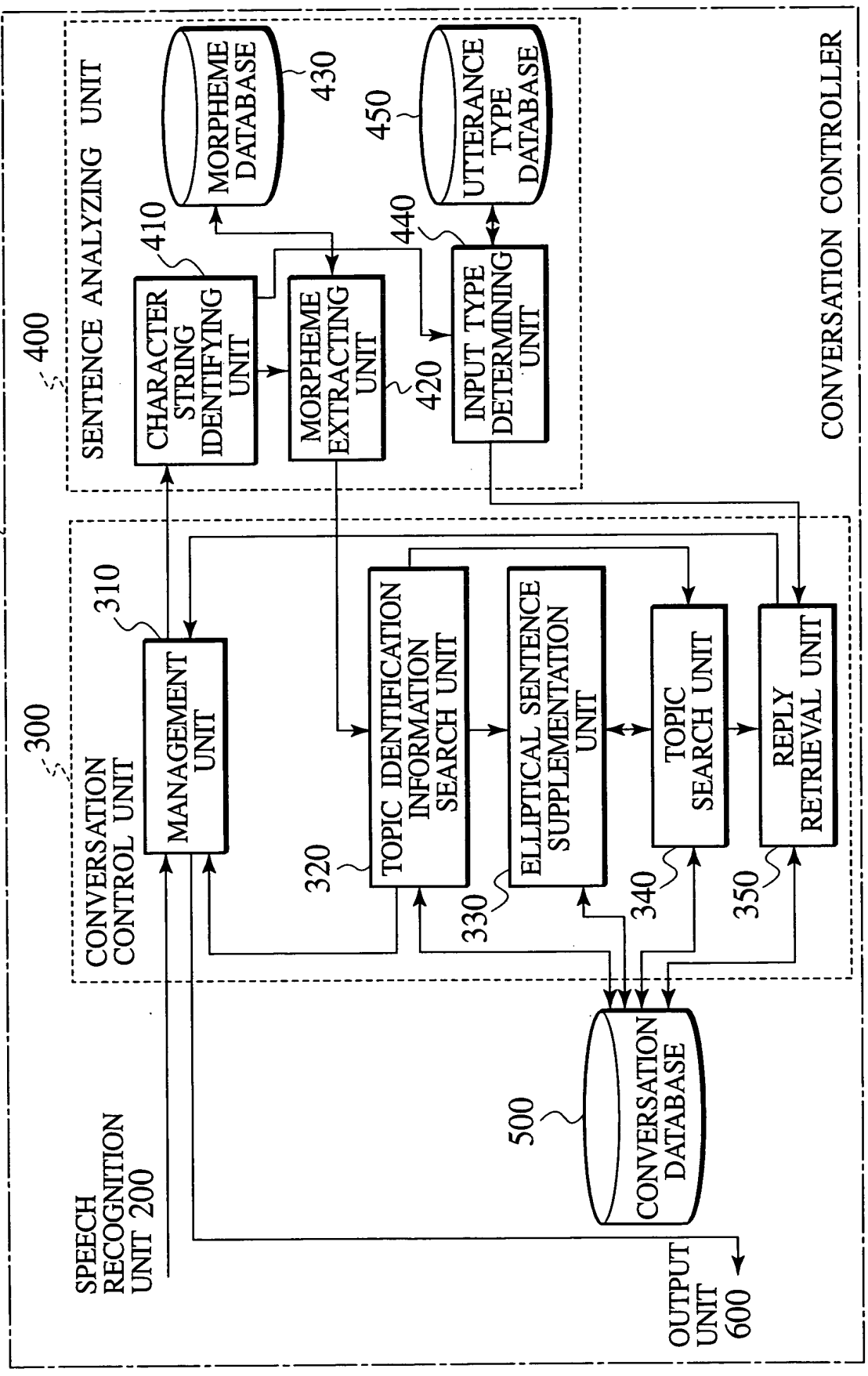
1
CONVERSATION CONTROLLER
SENTENCE ANALYZING UNIT
400
MORPHEME DATABASE
430
UTTERANCE TYPE DATABASE
450
410
CHARACTER STRING IDENTIFYING UNIT
MORPHEME EXTRACTING UNIT
420
440
INPUT TYPE DETERMINING UNIT
300
CONVERSATION CONTROL UNIT
310
MANAGEMENT UNIT
320
TOPIC IDENTIFICATION INFORMATION SEARCH UNIT
330
ELLIPTICAL SENTENCE SUPPLEMENTATION UNIT
340
TOPIC SEARCH UNIT
350
REPLY RETRIEVAL UNIT
500
CONVERSATION DATABASE
SPEECH RECOGNITION UNIT 200
OUTPUT UNIT 600

FIG. 3

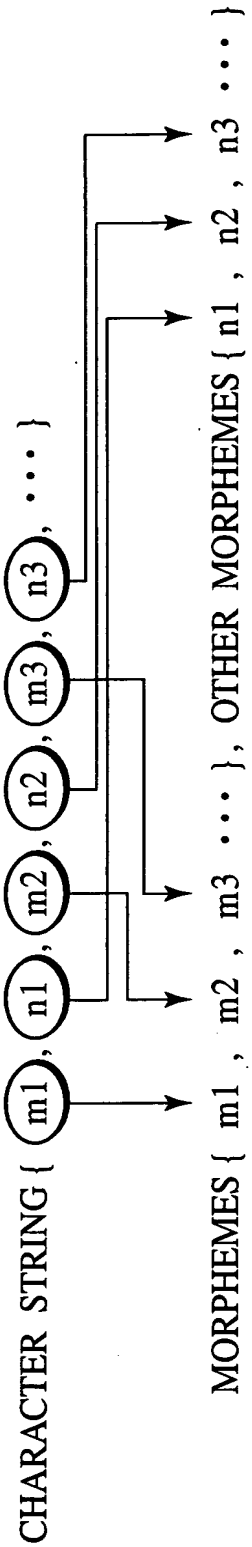
CHARACTER STRING { m1 , n1 , m2 , n2 , m3 , n3 , • • • }
MORPHEMES { m1 , m2 , m3 • • • }, OTHER MORPHEMES { n1 , n2 , n3 • • • }

FIG. 4

MEANING		DATA EXAMPLE
DA	DECLARATIVE AFFIRMATIVE SENTENCE	I LIKE SATO
LA	LOCATIONAL AFFIRMATIVE SENTENCE	I LIKE HIS SERIOUS FACE WHEN HE IS AT BAT
NA	NEGATIONAL AFFIRMATIVE SENTENCE	I DON'T WANT TO TALK WITH ANYONE WHO DISLIKES SATO
DQ	DECLARATIVE INTERROGATIVE SENTENCE	DO YOU LIKE SATO ?
LQ	LOCATIONAL INTERROGATIVE SENTENCE	HOW DO YOU LIKE SATO AT BAT ?
NQ	NEGATIONAL INTERROGATIVE SENTENCE	IT ISN'T TRUE THAT YOU LIKE SATO, IS IT ?
. . .	. . .	. . .

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FIG. 5

TYPE OF DETERMINATION	USED DICTIONARY
D	DEFINITION EXPRESSION DICTIONARY
N	NEGATIONAL EXPRESSION DICTIONARY
•	•
•	•
•	•

FIG. 6

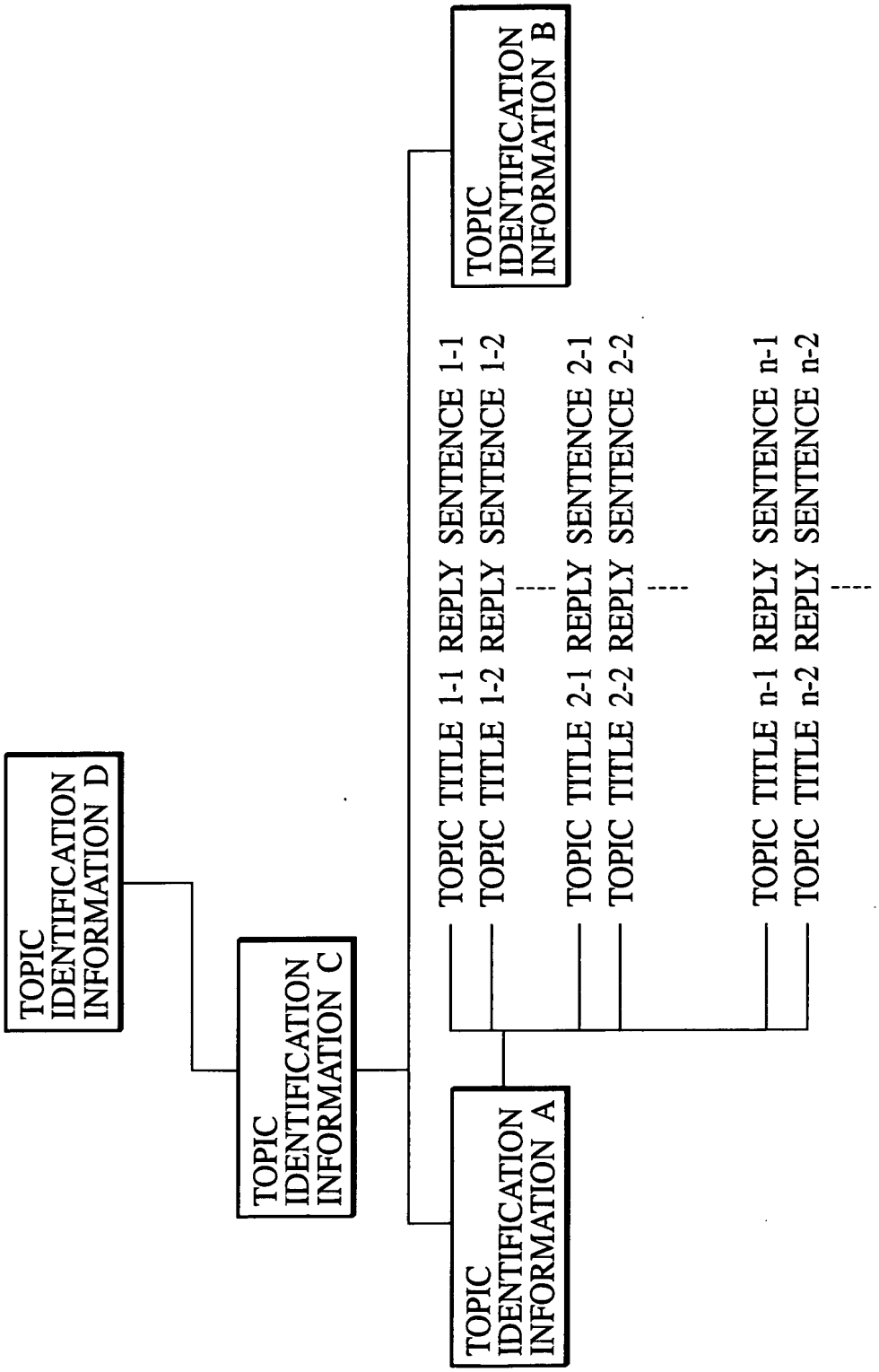
TOPIC IDENTIFICATION INFORMATION D
TOPIC IDENTIFICATION INFORMATION C
TOPIC IDENTIFICATION INFORMATION A
TOPIC IDENTIFICATION INFORMATION B
TOPIC TITLE 1-1 REPLY SENTENCE 1-1
TOPIC TITLE 1-2 REPLY SENTENCE 1-2
TOPIC TITLE 2-1 REPLY SENTENCE 2-1
TOPIC TITLE 2-2 REPLY SENTENCE 2-2
TOPIC TITLE n-1 REPLY SENTENCE n-1
TOPIC TITLE n-2 REPLY SENTENCE n-2

FIG. 7

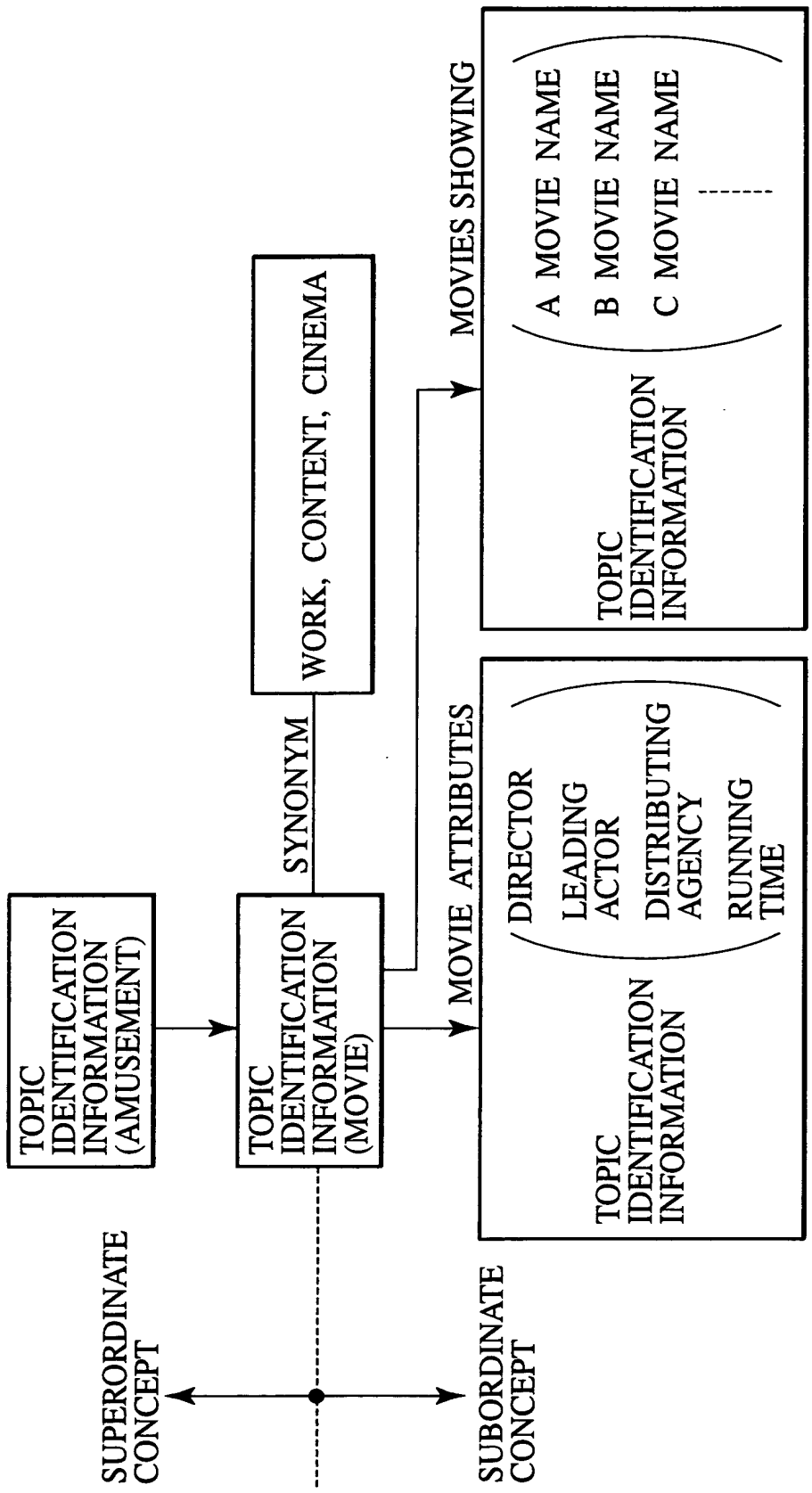
SUPERORDINATE CONCEPT
SUBORDINATE CONCEPT
TOPIC IDENTIFICATION INFORMATION (AMUSEMENT)
TOPIC IDENTIFICATION INFORMATION (MOVIE)
SYNONYM
WORK, CONTENT, CINEMA
MOVIE ATTRIBUTES
TOPIC IDENTIFICATION INFORMATION
DIRECTOR
LEADING ACTOR
DISTRIBUTING AGENCY
RUNNING TIME
MOVIES SHOWING
TOPIC IDENTIFICATION INFORMATION
A MOVIE NAME
B MOVIE NAME
C MOVIE NAME

FIG. 8

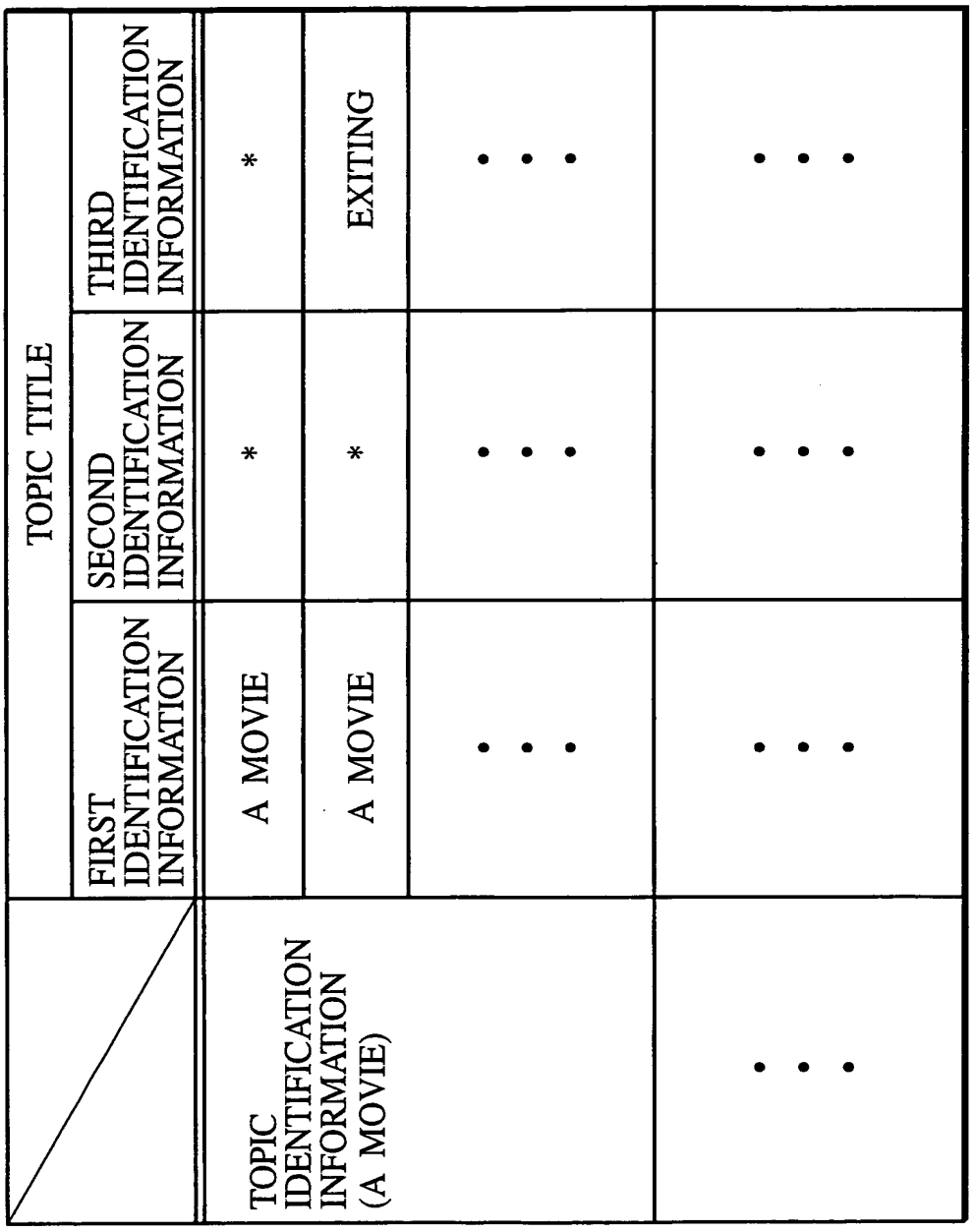
TOPIC TITLE
FIRST IDENTIFICATION INFORMATION
SECOND IDENTIFICATION INFORMATION
THIRD IDENTIFICATION INFORMATION
TOPIC IDENTIFICATION INFORMATION (A MOVIE)
A MOVIE
*
A MOVIE
*
EXITING

FIG. 9

<< TYPE OF REPLY SENTENCE >>

TYPE	CONTENT
D	DECLARATIVE SENTENCE
T	DECLARATIVE SENTENCE INCLUDING IDEA OF TIME SUCH AS "WHEN"
L	DECLARATIVE SENTENCE INCLUDING IDEA OF LOCATION SUCH AS "WHERE"
N	SENTENCE NEGATING DECLARATIVE SENTENCE
• • •	• • •

FIG. 10

TOPIC IDENTIFICATION INFORMATION (SATO) SUBORDINATE CONCEPT = (HOME RUN) SUPERORDINATE CONCEPT = (SANDLOT BASEBALL) SYNONYM = (PANDA SATO, PLAYER SATO, PANDA)			
		TYPE OF RESPONSE	CONTENT
TOPIC TITLE 1-1 (SATO ; * ; LIKE)	REPLY SENTENCE 1-1	DA TA	I LIKE SATO TOO I LIKE SATO AT BAT
TOPIC TITLE 1-2	REPLY SENTENCE 1-2	• • •	
• • •	• • •	• • •	

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FIG. 11

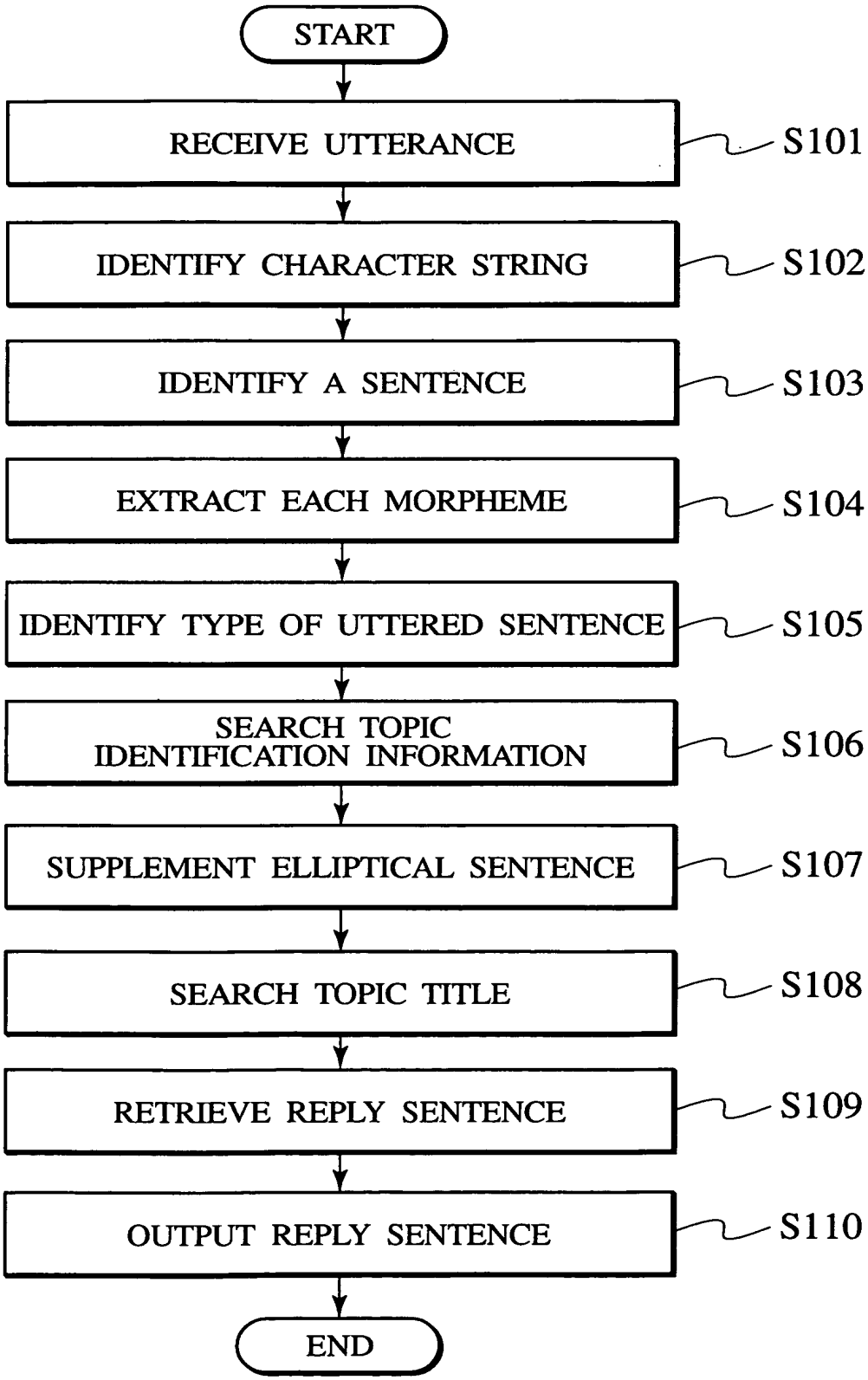
START
RECEIVE UTTERANCE
S101
IDENTIFY CHARACTER STRING
S102
IDENTIFY A SENTENCE
S103
EXTRACT EACH MORPHEME
S104
IDENTIFY TYPE OF UTTERED SENTENCE
S105
SEARCH TOPIC IDENTIFICATION INFORMATION
S106
SUPPLEMENT ELLIPTICAL SENTENCE
S107
SEARCH TOPIC TITLE
S108
RETRIEVE REPLY SENTENCE
S109
OUTPUT REPLY SENTENCE
S110
END

FIG. 12

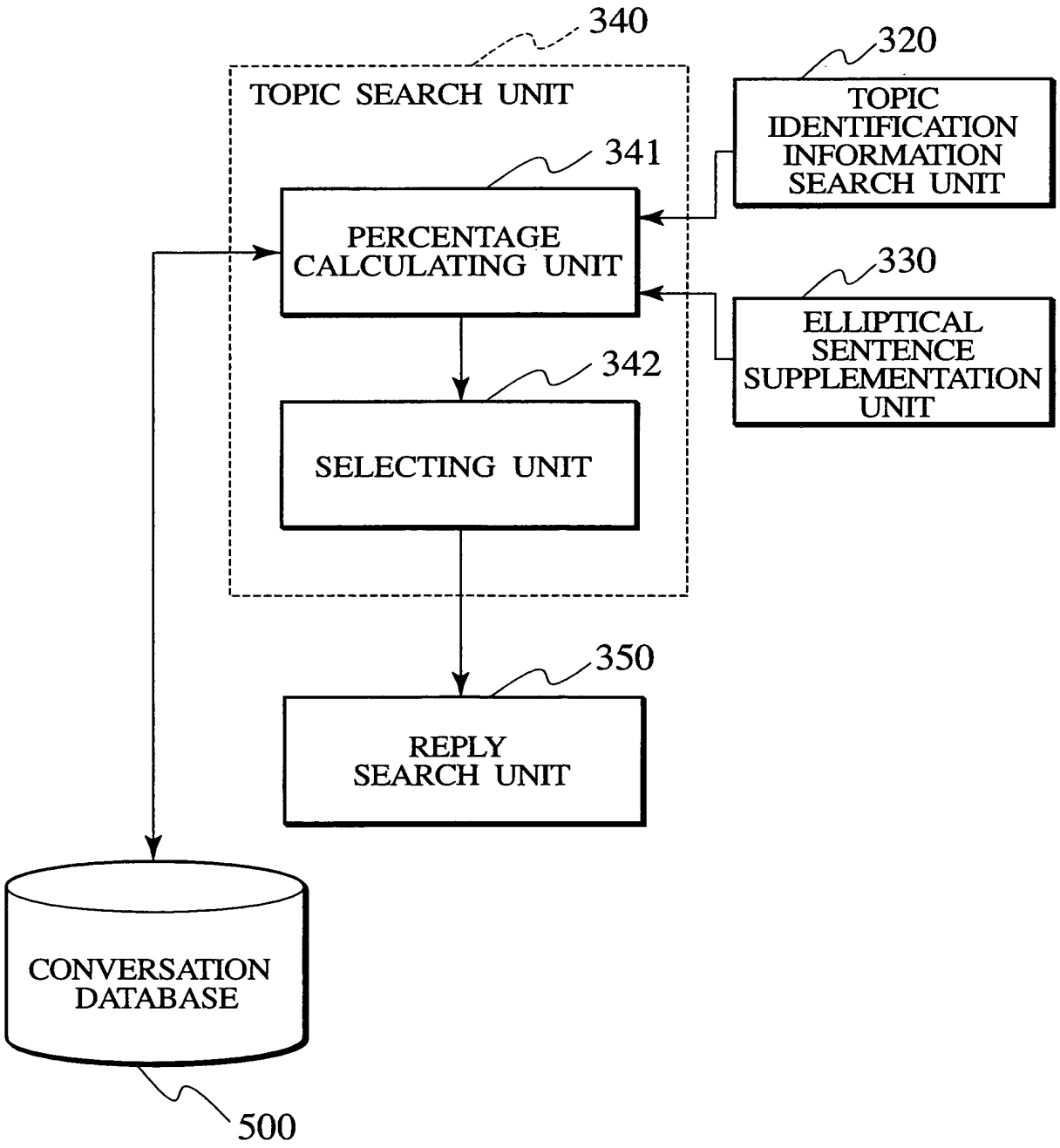
340
TOPIC SEARCH UNIT
320
TOPIC IDENTIFICATION INFORMATION SEARCH UNIT
341
PERCENTAGE CALCULATING UNIT
330
ELLIPTICAL SENTENCE SUPPLEMENTATION UNIT
342
SELECTING UNIT
350
REPLY SEARCH UNIT
CONVERSATION DATABASE
500

FIG. 13

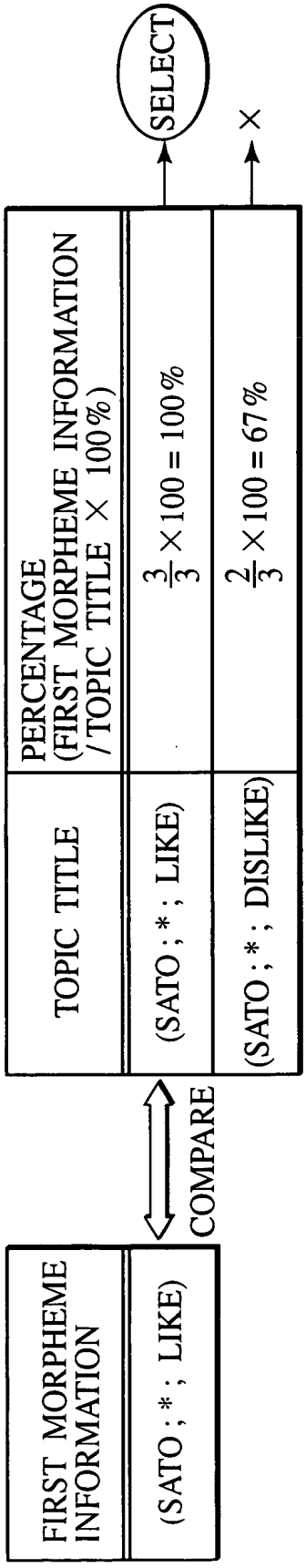
FIRST MORPHEME INFORMATION
(SATO ; * ; LIKE)
COMPARE
TOPIC TITLE
PERCENTAGE (FIRST MORPHEME INFORMATION / TOPIC TITLE × 100%)
(SATO ; * ; LIKE)
3/3 × 100 = 100%
(SATO ; * ; DISLIKE)
2/3 × 100 = 67%
SELECT
×

FIG. 14

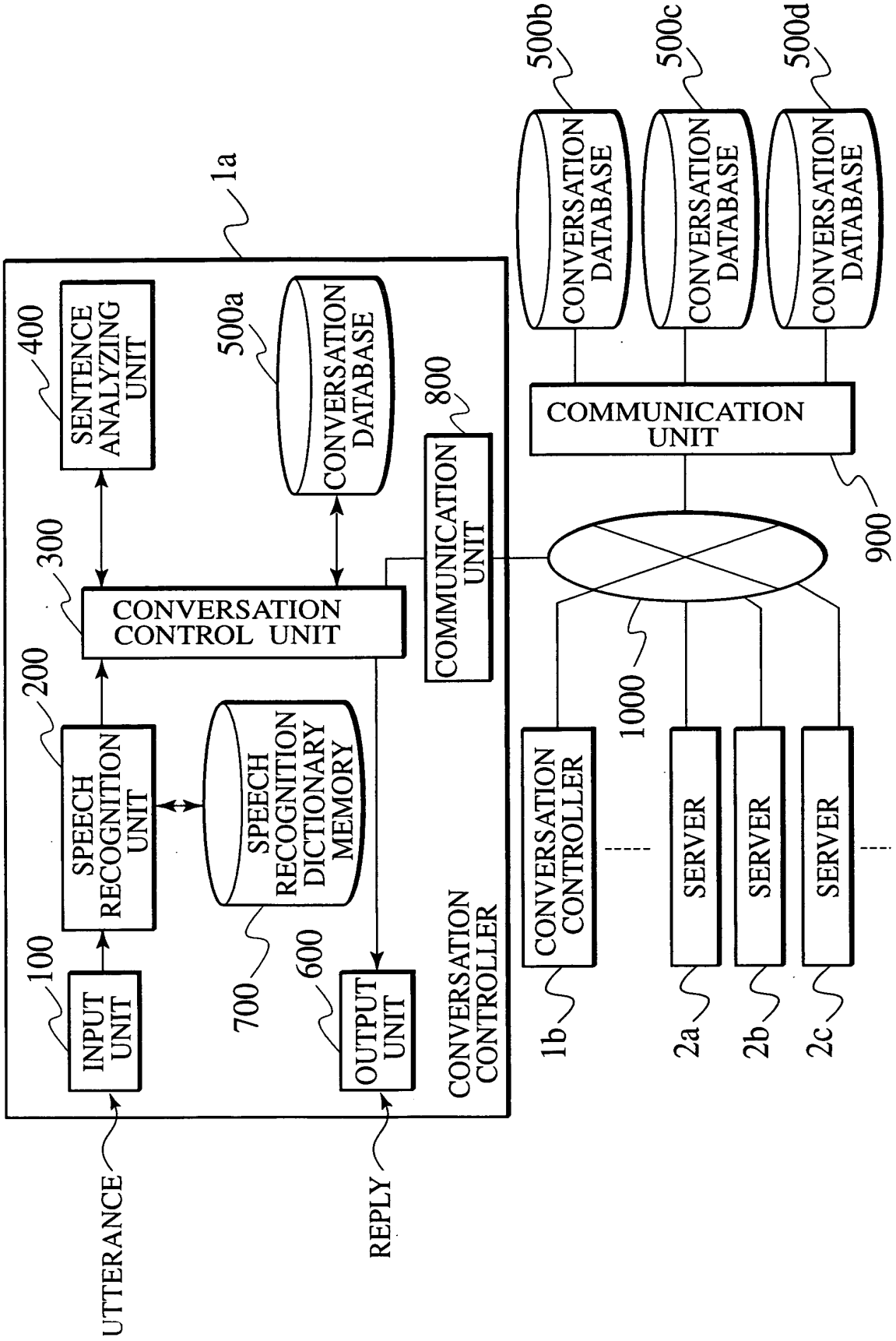
1a
100
INPUT UNIT
200
SPEECH RECOGNITION UNIT
300
CONVERSATION CONTROL UNIT
400
SENTENCE ANALYZING UNIT
500a
CONVERSATION DATABASE
500b
CONVERSATION DATABASE
500c
CONVERSATION DATABASE
500d
CONVERSATION DATABASE
600
OUTPUT UNIT
700
SPEECH RECOGNITION DICTIONARY MEMORY
800
COMMUNICATION UNIT
900
COMMUNICATION UNIT
1000
CONVERSATION CONTROLLER
1b
SERVER
2a
SERVER
2b
SERVER
2c
CONVERSATION CONTROLLER
UTTERANCE
REPLY

FIG. 15

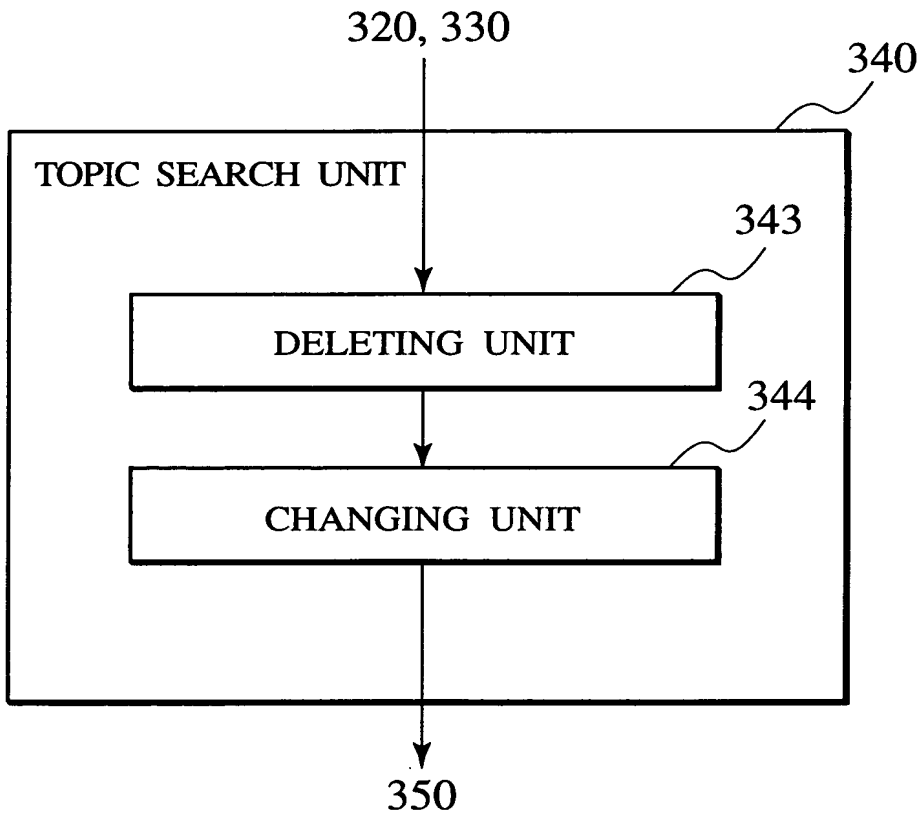
320, 330
340
TOPIC SEARCH UNIT
343
DELETING UNIT
344
CHANGING UNIT
350

FIG. 16

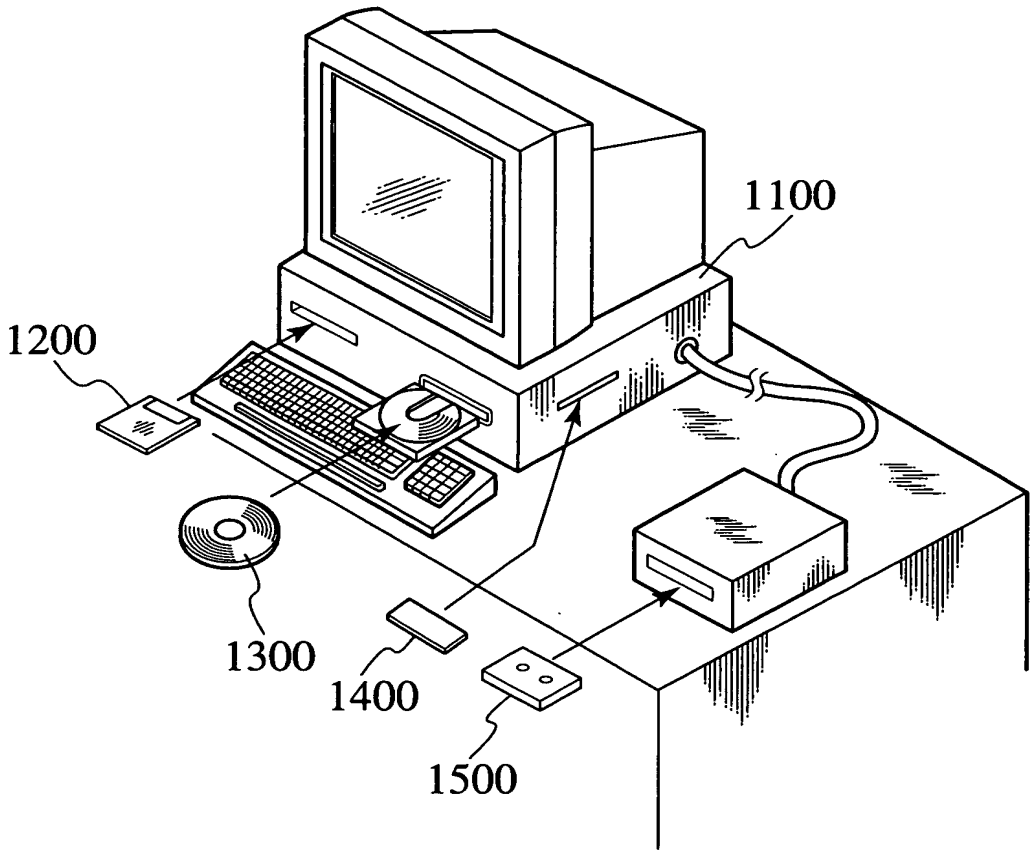

FIG. 17

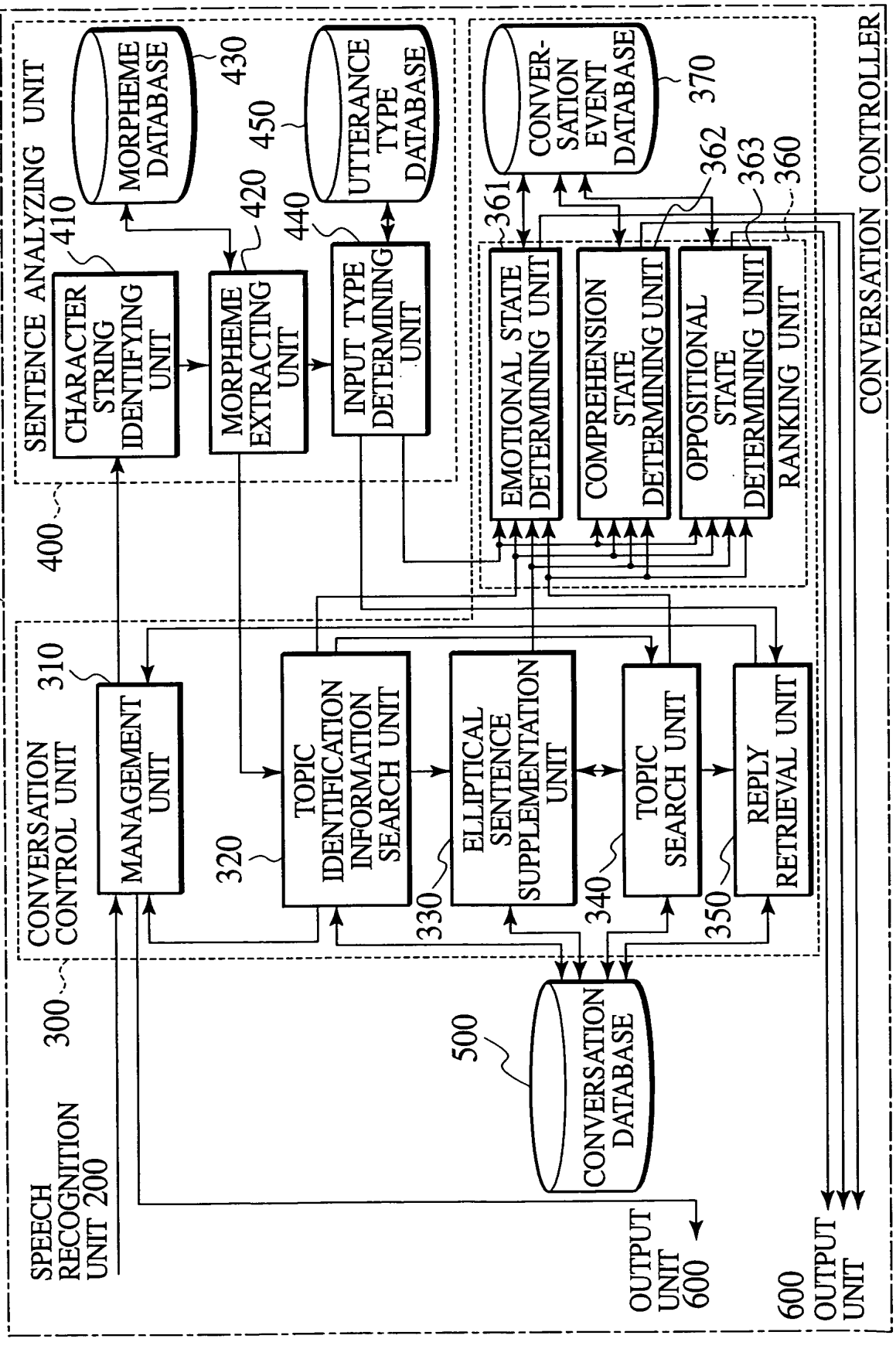
1
CONVERSATION CONTROLLER
SENTENCE ANALYZING UNIT
400
CHARACTER STRING IDENTIFYING UNIT
410
MORPHEME EXTRACTING UNIT
420
INPUT TYPE DETERMINING UNIT
440
MORPHEME DATABASE
430
UTTERANCE TYPE DATABASE
450
CONVERSATION EVENT DATABASE
370
EMOTIONAL STATE DETERMINING UNIT
361
COMPREHENSION STATE DETERMINING UNIT
362
OPPOSITIONAL STATE DETERMINING UNIT
363
RANKING UNIT
360
CONVERSATION CONTROL UNIT
300
MANAGEMENT UNIT
310
TOPIC IDENTIFICATION INFORMATION SEARCH UNIT
320
ELLIPTICAL SENTENCE SUPPLEMENTATION UNIT
330
TOPIC SEARCH UNIT
340
REPLY RETRIEVAL UNIT
350
CONVERSATION DATABASE
500
SPEECH RECOGNITION UNIT 200
OUTPUT UNIT 600
600 OUTPUT UNIT

FIG. 18

	CONVERSATION EVENT			
	COHESION FACTOR	CONVERSATION CHANGE	HARASSMENT FACTOR	OPPOSITION FACTOR
ELLIPTICAL SENTENCE SUPPLEMENTATION PROCESSING	○			
REPLY IMPOSSIBLE PROCESSING			○	
UTTERANCE TYPE DETERMINATION PROCESSING				○
TOPIC IDENTIFICATION INFORMATION RETRIEVAL		○		

FIG. 19

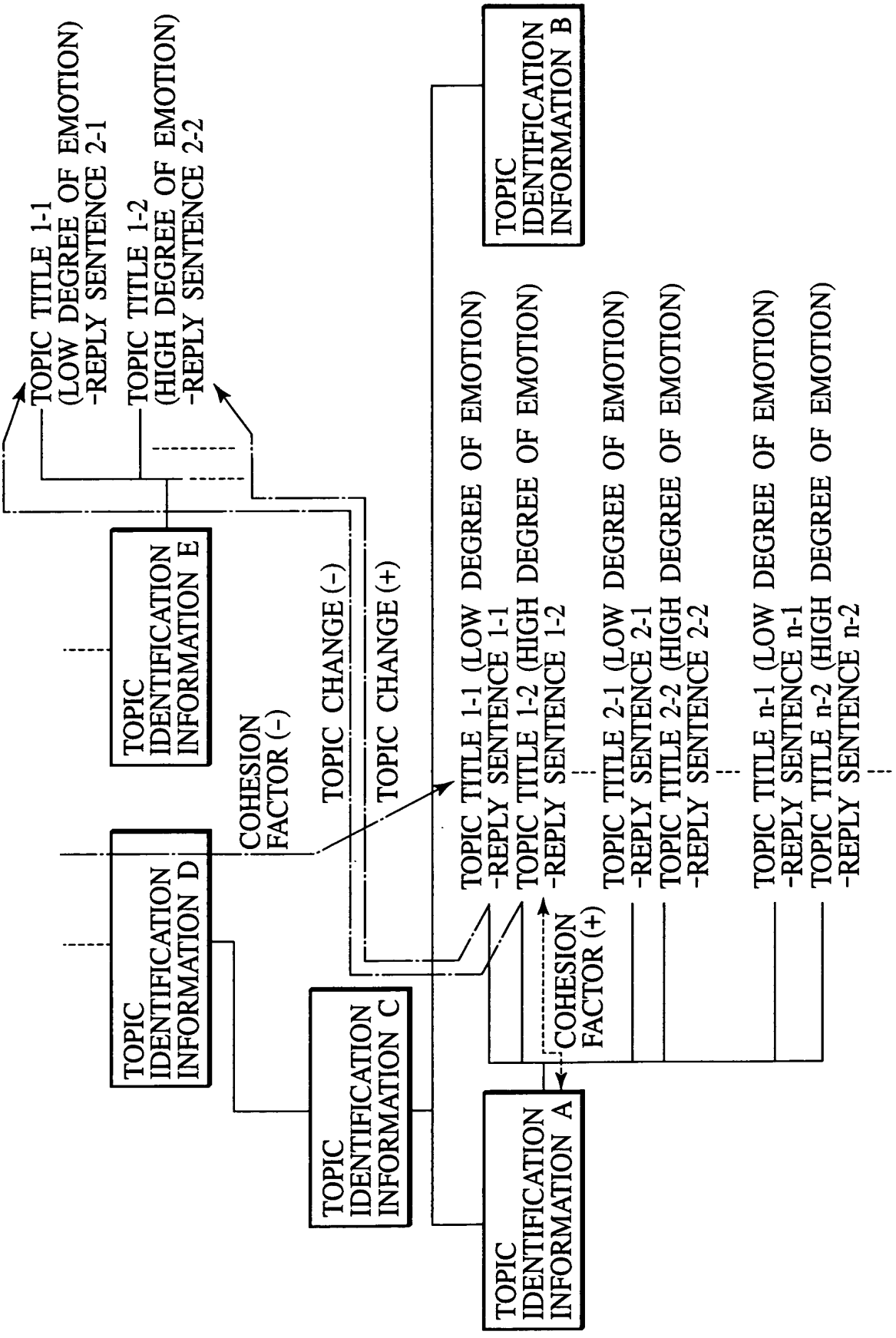
TOPIC IDENTIFICATION INFORMATION A
TOPIC IDENTIFICATION INFORMATION B
TOPIC IDENTIFICATION INFORMATION C
TOPIC IDENTIFICATION INFORMATION D
TOPIC IDENTIFICATION INFORMATION E
TOPIC TITLE 1-1 (LOW DEGREE OF EMOTION) -REPLY SENTENCE 1-1
TOPIC TITLE 1-2 (HIGH DEGREE OF EMOTION) -REPLY SENTENCE 1-2
TOPIC TITLE 2-1 (LOW DEGREE OF EMOTION) -REPLY SENTENCE 2-1
TOPIC TITLE 2-2 (HIGH DEGREE OF EMOTION) -REPLY SENTENCE 2-2
TOPIC TITLE n-1 (LOW DEGREE OF EMOTION) -REPLY SENTENCE n-1
TOPIC TITLE n-2 (HIGH DEGREE OF EMOTION) -REPLY SENTENCE n-2
COHESION FACTOR (+)
COHESION FACTOR (-)
TOPIC CHANGE (+)
TOPIC CHANGE (-)
TOPIC TITLE 1-1 (LOW DEGREE OF EMOTION) -REPLY SENTENCE 2-1
TOPIC TITLE 1-2 (HIGH DEGREE OF EMOTION) -REPLY SENTENCE 2-2

FIG. 20

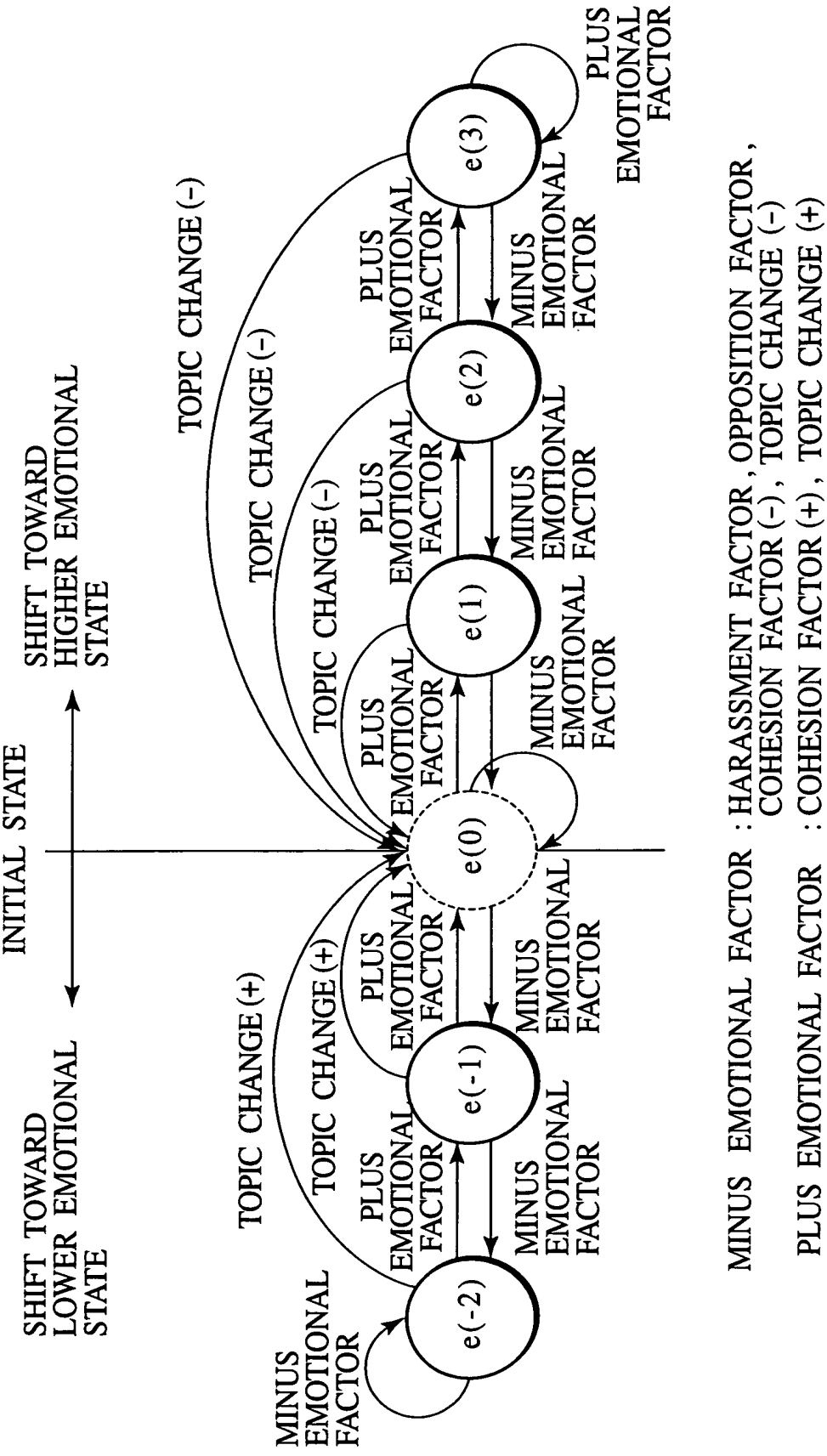
INITIAL STATE
SHIFT TOWARD HIGHER EMOTIONAL STATE
SHIFT TOWARD LOWER EMOTIONAL STATE
e(0)
e(1)
e(2)
e(3)
e(-1)
e(-2)
TOPIC CHANGE (-)
TOPIC CHANGE (+)
PLUS EMOTIONAL FACTOR
MINUS EMOTIONAL FACTOR
MINUS EMOTIONAL FACTOR : HARASSMENT FACTOR, OPPOSITION FACTOR, COHESION FACTOR (-), TOPIC CHANGE (-)
PLUS EMOTIONAL FACTOR : COHESION FACTOR (+), TOPIC CHANGE (+)

FIG. 21

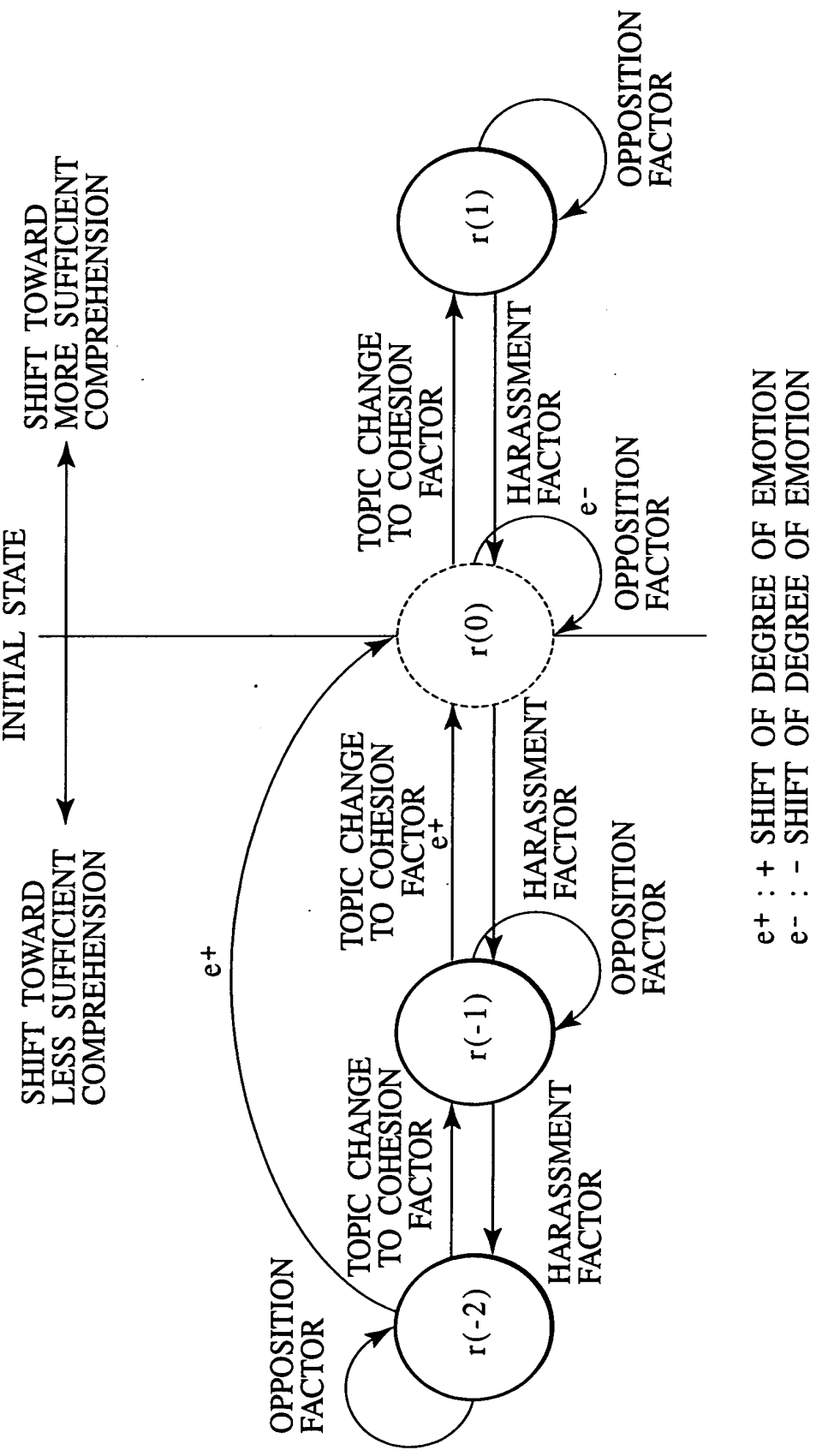
SHIFT TOWARD MORE SUFFICIENT COMPREHENSION
INITIAL STATE
SHIFT TOWARD LESS SUFFICIENT COMPREHENSION
r(1)
r(0)
r(-1)
r(-2)
OPPOSITION FACTOR
TOPIC CHANGE TO COHESION FACTOR
HARASSMENT FACTOR
e+
e-
e+ : + SHIFT OF DEGREE OF EMOTION
e- : - SHIFT OF DEGREE OF EMOTION

FIG. 22

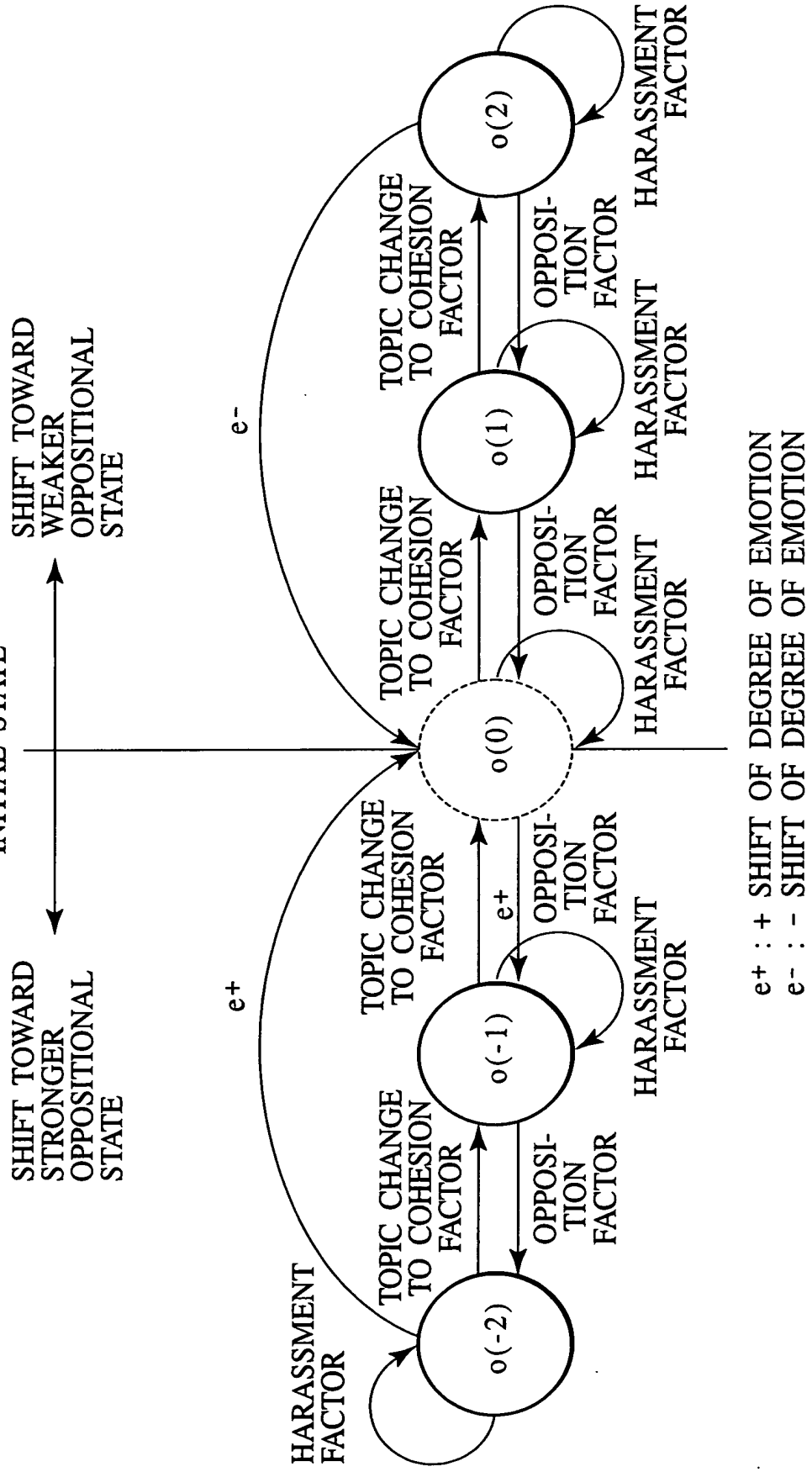
INITIAL STATE
SHIFT TOWARD WEAKER OPPOSITIONAL STATE
SHIFT TOWARD STRONGER OPPOSITIONAL STATE
e-
e+
o(2)
o(1)
o(0)
o(-1)
o(-2)
TOPIC CHANGE TO COHESION FACTOR
OPPOSITION FACTOR
HARASSMENT FACTOR
e+ : + SHIFT OF DEGREE OF EMOTION
e- : - SHIFT OF DEGREE OF EMOTION

FIG. 23

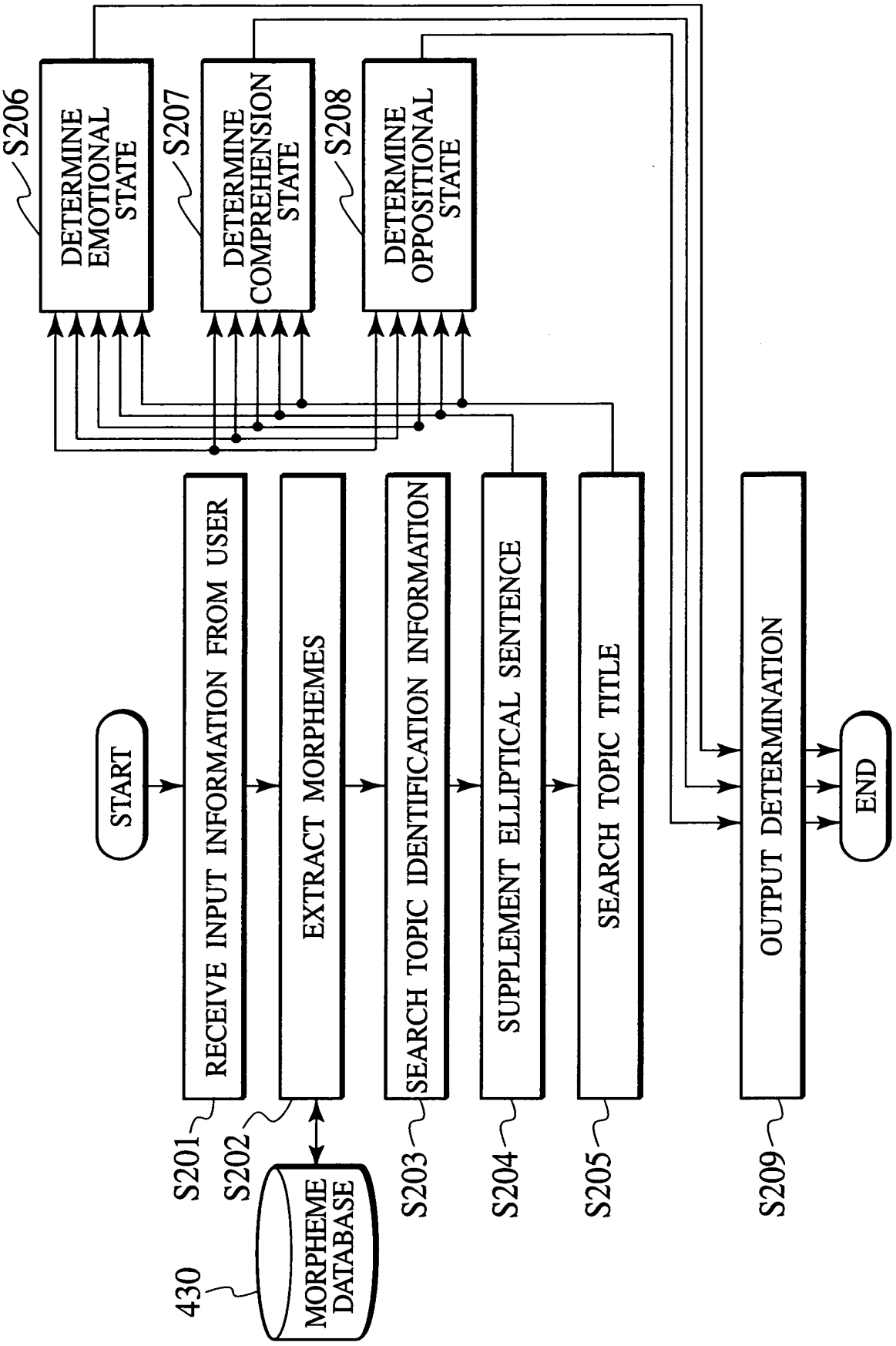
START
RECEIVE INPUT INFORMATION FROM USER
EXTRACT MORPHEMES
SEARCH TOPIC IDENTIFICATION INFORMATION
SUPPLEMENT ELLIPTICAL SENTENCE
SEARCH TOPIC TITLE
OUTPUT DETERMINATION
END
MORPHEME DATABASE
430
S201
S202
S203
S204
S205
S209
DETERMINE EMOTIONAL STATE
DETERMINE COMPREHENSION STATE
DETERMINE OPPOSITIONAL STATE
S206
S207
S208

FIG. 24

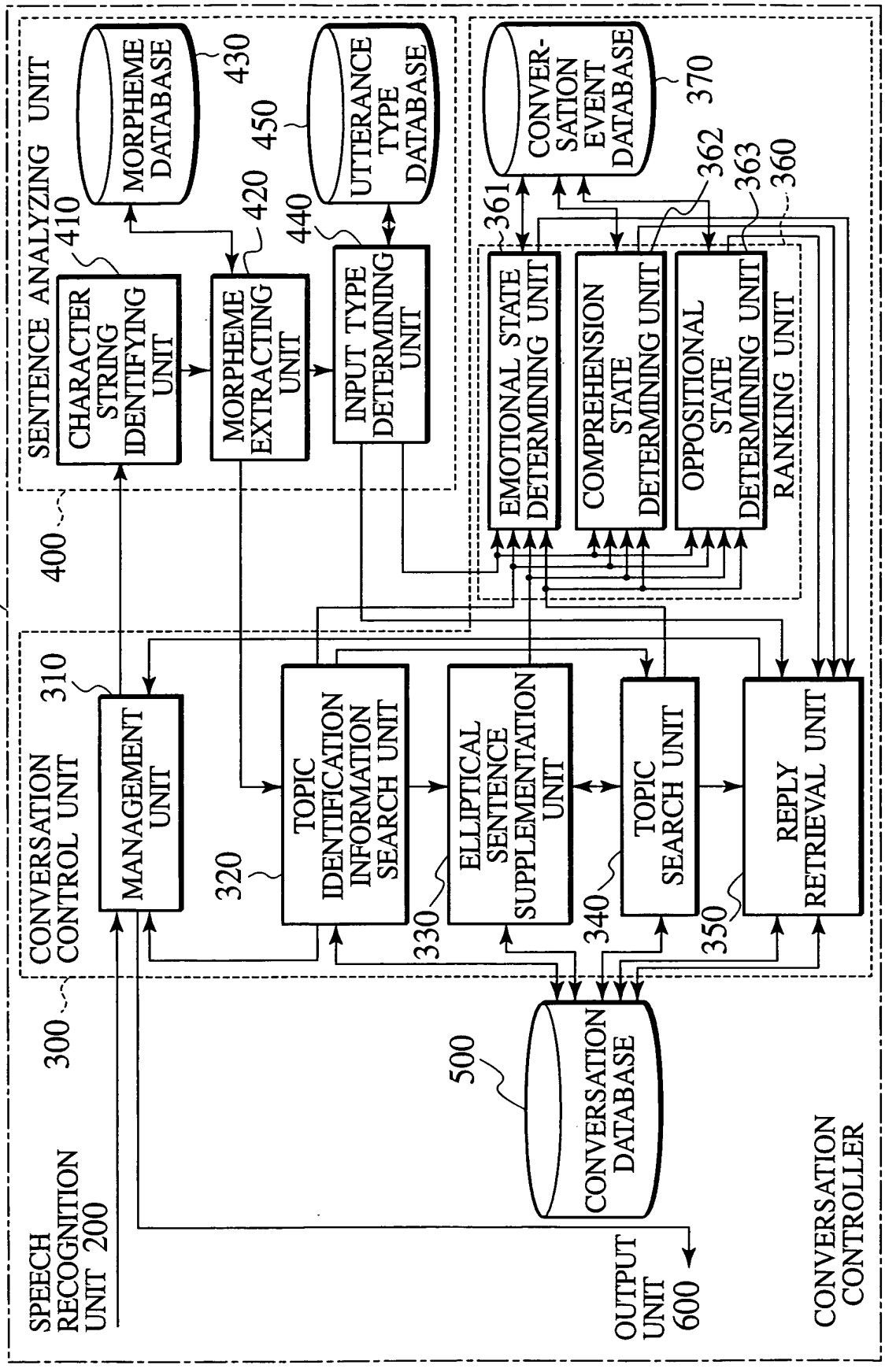
1
CONVERSATION CONTROLLER
SPEECH RECOGNITION UNIT 200
OUTPUT UNIT 600
CONVERSATION CONTROL UNIT
300
MANAGEMENT UNIT
310
TOPIC IDENTIFICATION INFORMATION SEARCH UNIT
320
ELLIPTICAL SENTENCE SUPPLEMENTATION UNIT
330
TOPIC SEARCH UNIT
340
REPLY RETRIEVAL UNIT
350
CONVERSATION DATABASE
500
SENTENCE ANALYZING UNIT
400
CHARACTER STRING IDENTIFYING UNIT
410
MORPHEME EXTRACTING UNIT
420
INPUT TYPE DETERMINING UNIT
440
MORPHEME DATABASE
430
UTTERANCE TYPE DATABASE
450
RANKING UNIT
360
EMOTIONAL STATE DETERMINING UNIT
361
COMPREHENSION STATE DETERMINING UNIT
362
OPPOSITIONAL STATE DETERMINING UNIT
363
CONVERSATION EVENT DATABASE
370

FIG. 25

TOPIC IDENTIFICATION INFORMATION (HORSE)			
TOPIC TITLE 1 (HORSE ; * ; LIKE)	TYPE OF RESPONSE	PRIORITY LEVEL	REPLY SENTENCE
	DQ (DECLARATIVE INTERROGATIVE SENTENCE)	3	REPLY SENTENCE 1-1
		2	REPLY SENTENCE 1-2
		1	REPLY SENTENCE 1-3
		⋮	⋮
	LQ (LOCATIONAL INTERROGATIVE SENTENCE)	3	REPLY SENTENCE 2-1
		⋮	⋮
	TQ (TIME INTERROGATIVE SENTENCE)	3	REPLY SENTENCE 3-1
		⋮	⋮
TOPIC TITLE 2 ⋮	⋮	⋮	⋮

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FIG. 26

TOPIC IDENTIFICATION INFORMATION (HORSE) TOPIC TITLE 1 (HORSE ; * ; LIKE) TYPE OF RESPONSE DA		
RANKING	PRIORITY LEVEL	REPLY SENTENCE
3	3	REPLY SENTENCE 1-1 (HORSES ARE REALLY ENERGETIC AND BEAUTIFUL, AREN'T THEY)
2	2	REPLY SENTENCE 1-2 (HORSES ARE REALLY BEAUTIFUL, AREN'T THEY)
1	1	REPLY SENTENCE 1-3 (HORSES ARE BEAUTIFUL, AREN'T THEY)
0	0	REPLY SENTENCE 1-4 (I THINK THE APPEARANCE OF HORSES IS ORDINARY)
-1	-1	REPLY SENTENCE 1-5 (I DON'T KNOW HORSES ARE BEAUTIFUL)
-2	-2	REPLY SENTENCE 1-6 (HORSES AREN'T BEAUTIFUL)
-3	-3	REPLY SENTENCE 1-7 (I HAVE NO INTEREST IN HORSES)

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FIG. 27

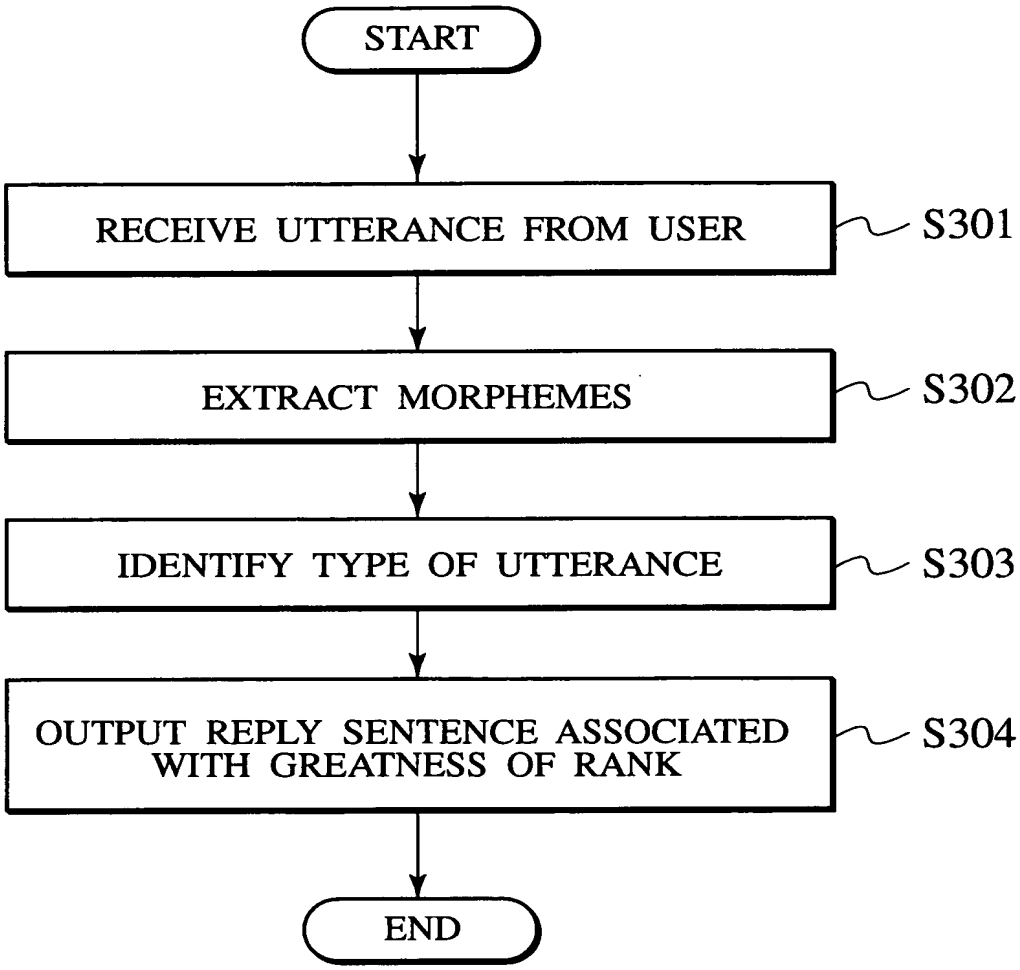
START
RECEIVE UTTERANCE FROM USER
S301
EXTRACT MORPHEMES
S302
IDENTIFY TYPE OF UTTERANCE
S303
OUTPUT REPLY SENTENCE ASSOCIATED WITH GREATNESS OF RANK
S304
END

FIG. 28

OPPOSITION CONTENTS
SHUT UP
YOU IDIOT
⋮

FIG. 29

APOLOGY CONTENTS
I WAS WRONG
I WON'T SAY BAD THINGS ANYMORE
⋮